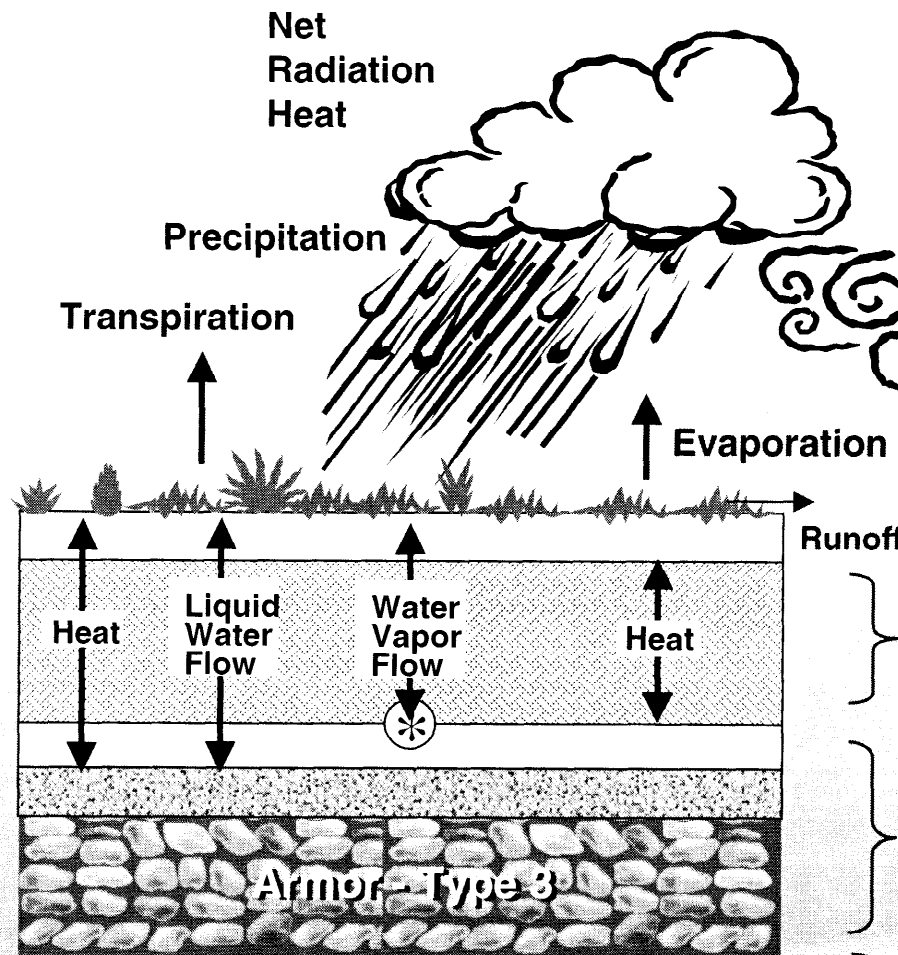


30% Cover Hydrologic Model

Infiltration Evaluation Approach “Dry” Cover System



*Node location for evaluating flow through the cover (observation node)

Components

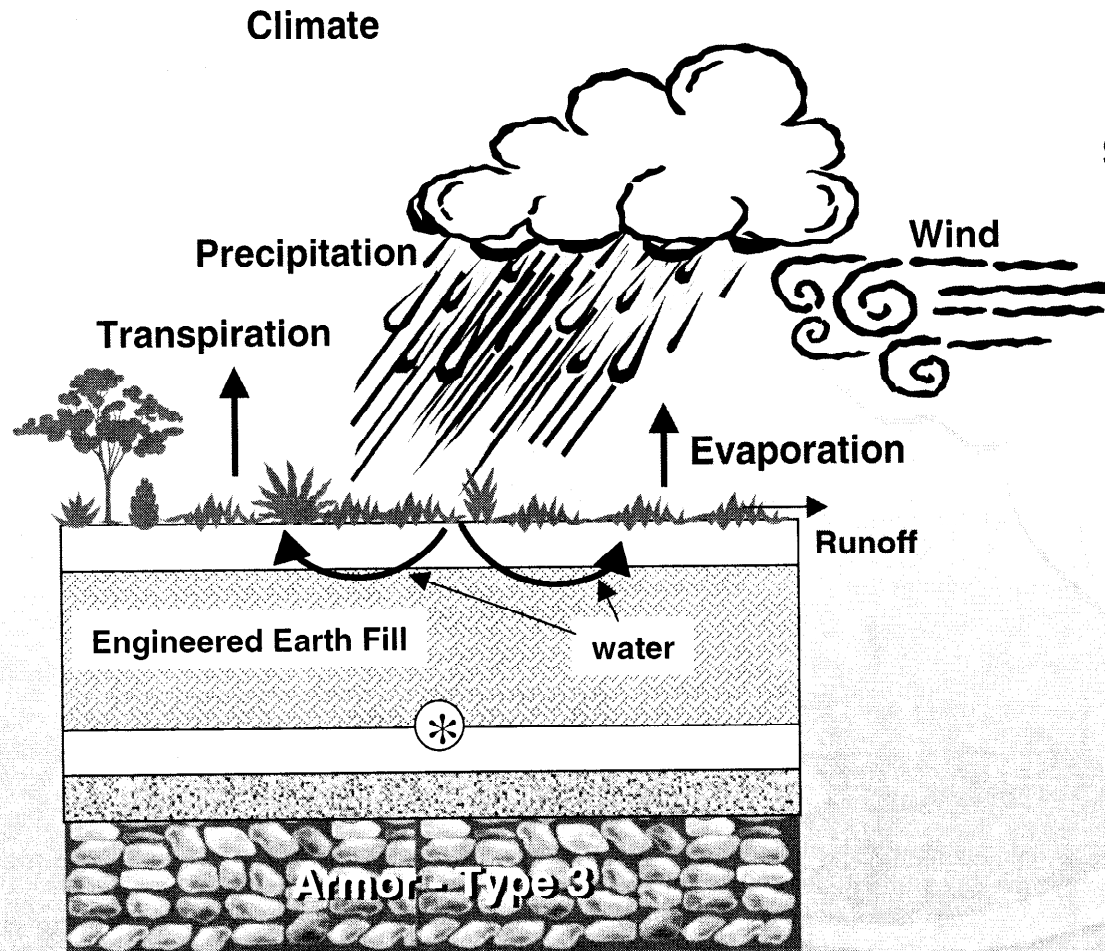
Water Storage – Fine grained (i.e., silty loam) soil providing high soil suction capacity

Capillary Break – Contrasting fine over coarse material keeps water in water storage component

Subtitle C Barrier and lateral drainage provide redundant protection

30% Cover Hydrological Model

Infiltration Evaluation Approach “Dry” Cover System



*Node location for evaluating flow
through the cover (observation node)

Model Software:

Soil Cover™ Computer Program -
University of Saskatchewan




- ◆ Predicts the exchange of water and energy between the atmosphere and soil surface
- ◆ Predicts movement of water within the cover section

30% Cover Hydrologic Model

Infiltration Evaluation

Climate Data Selection Criteria Based on Precipitation

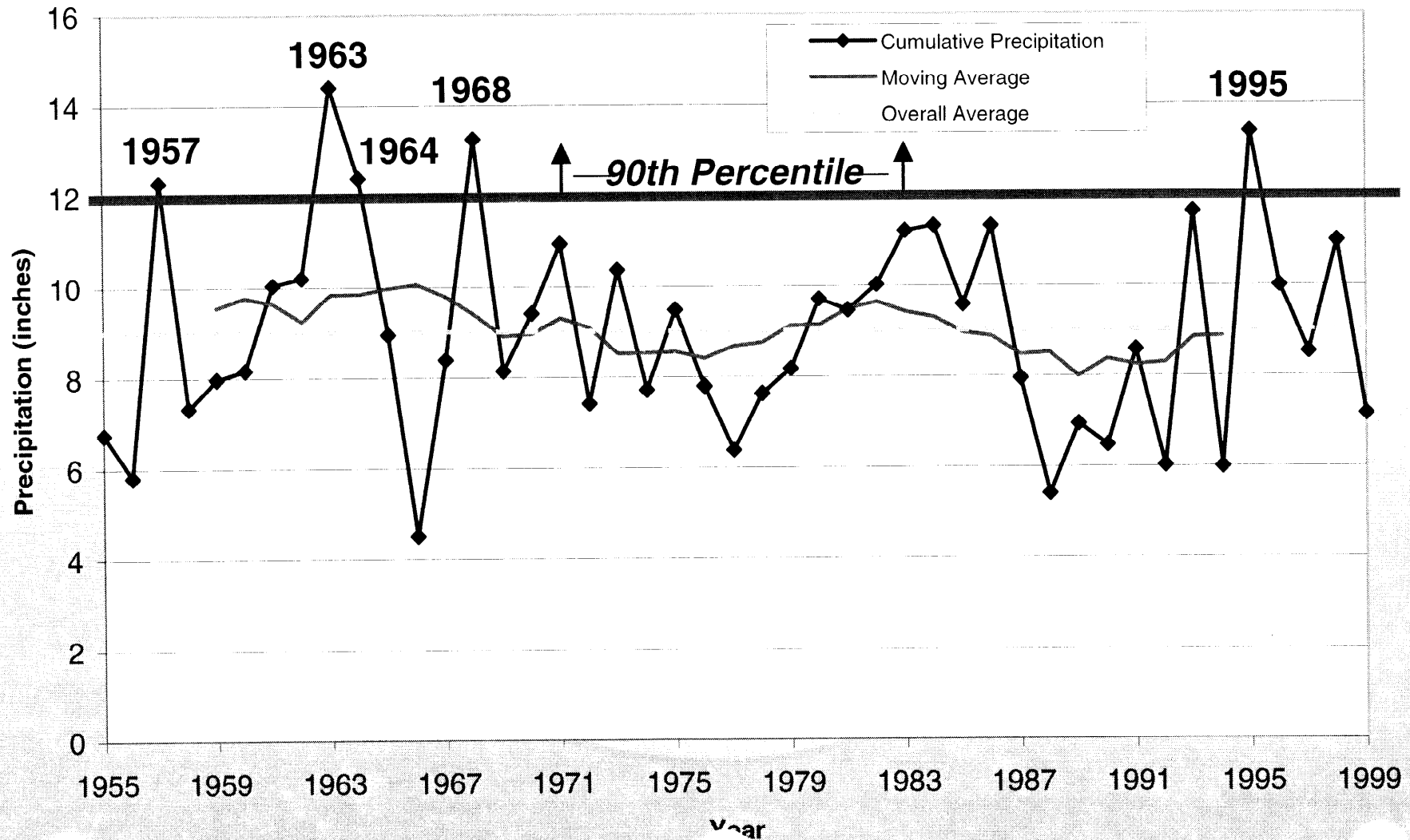
Precipitation

- ◆ ***Average period of record: 1950 to 1994***  ***8.6 inches/year
(218 mm/year)***
- ◆ ***Base Case: Selected 10-year period: 1967 to 1976***  ***9.3 inches/year
(236 mm/year)***
- ◆ ***Extreme Case (90th percentile):
Selected 1957, 1963, 1964, 1968,
and 1995***  ***12.0 inches/year
(305 mm/year)***

30% Cover Hydrologic Model

Infiltration Evaluation

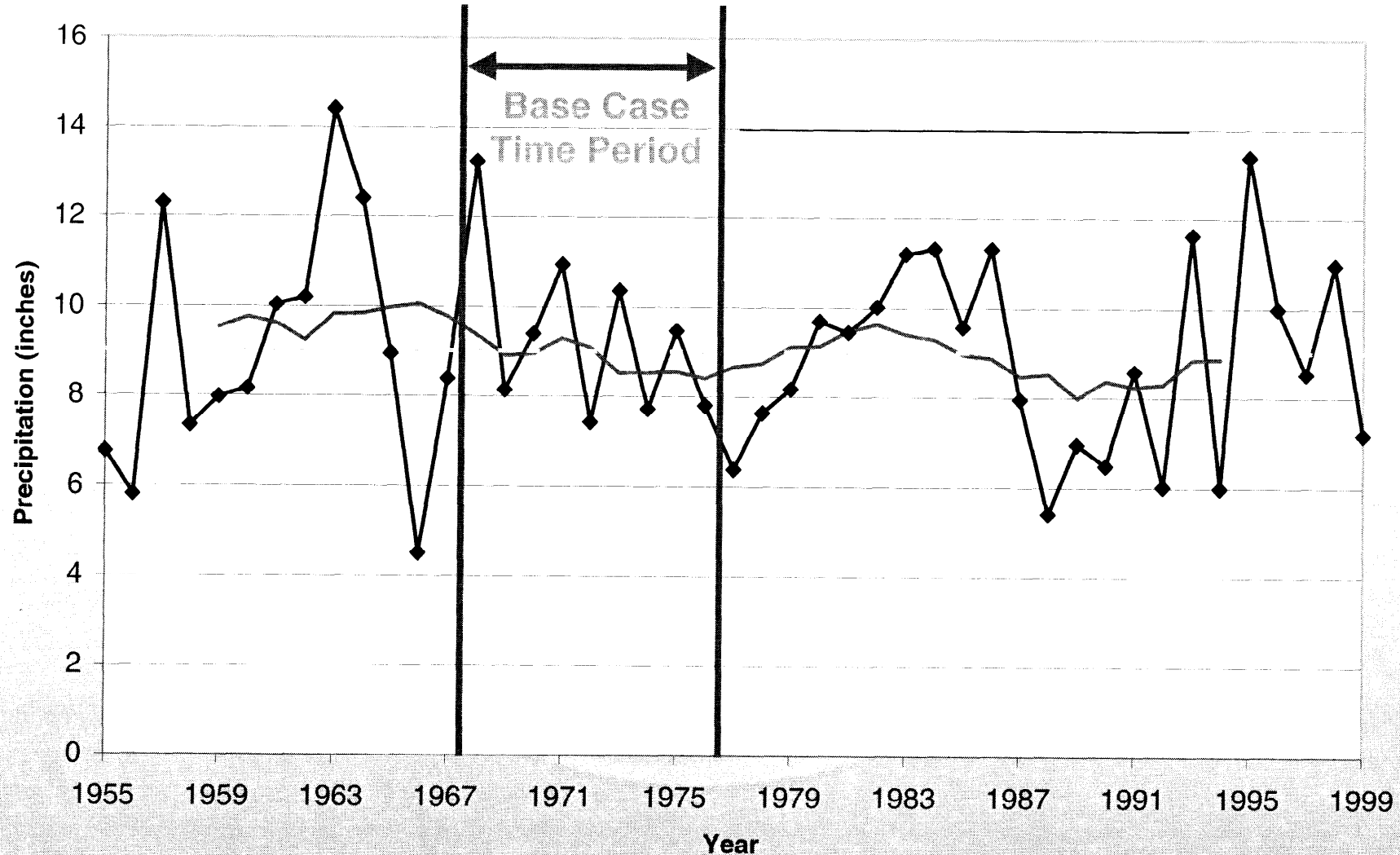
Extreme Case Time Period Selection



30% Cover Hydrologic Model

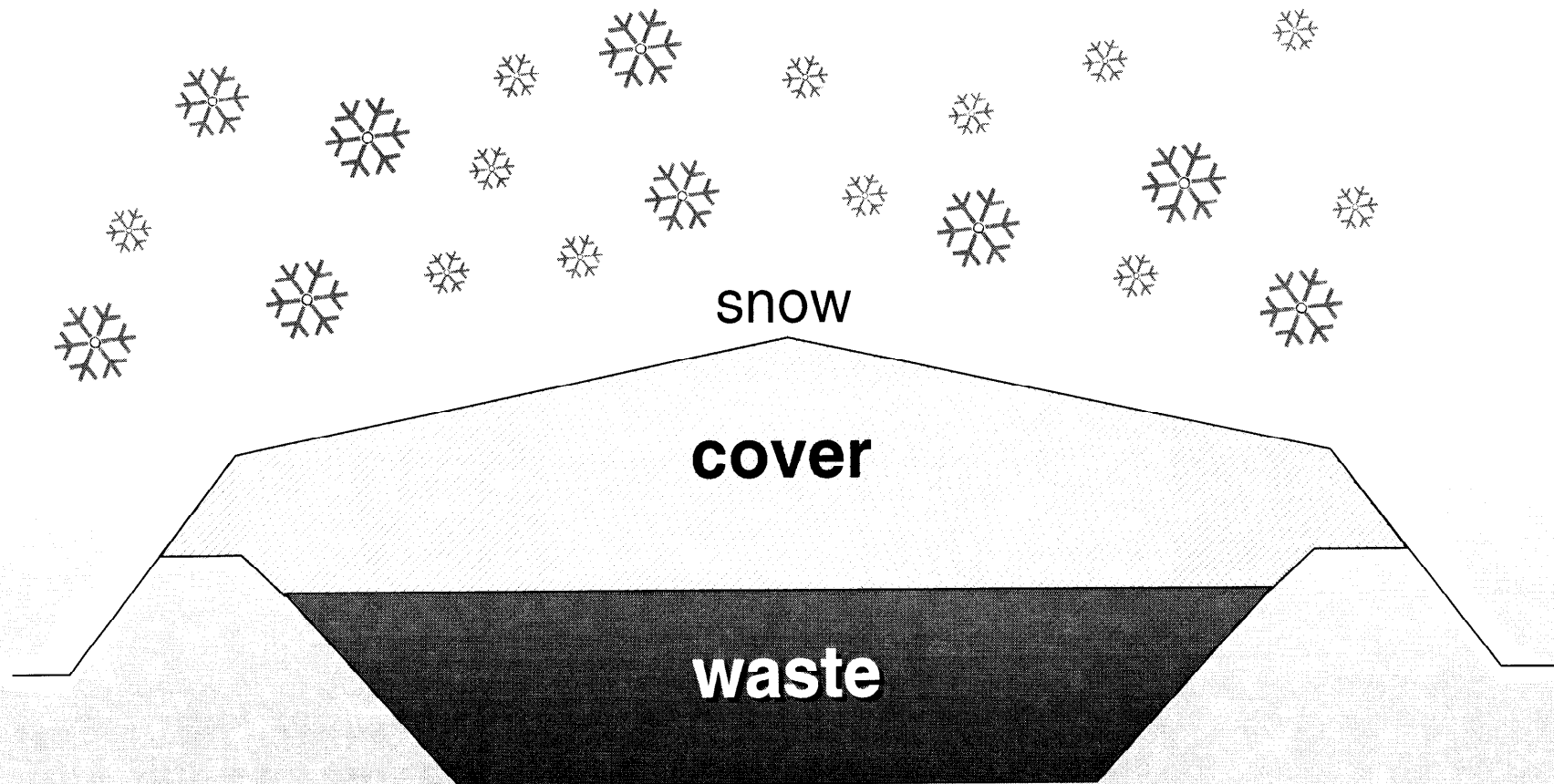
Infiltration Evaluation

Base Case Time Period Selection



30% Cover Hydrologic Model

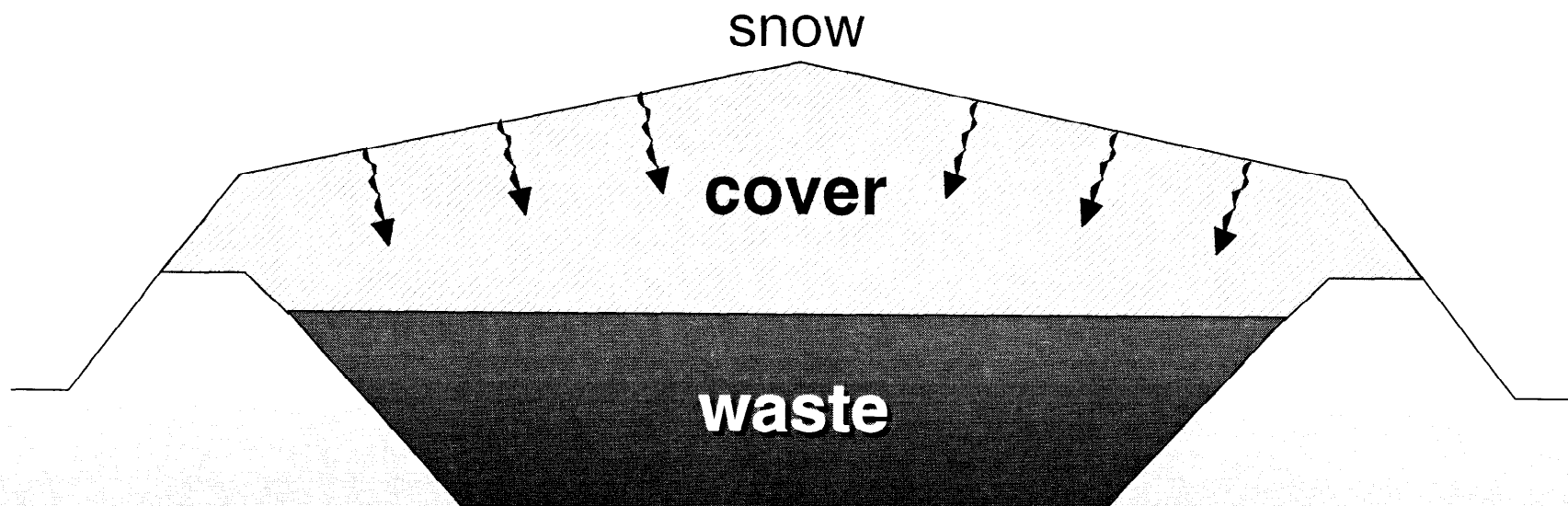
Infiltration Evaluation



November 29
Start of Snow Pack – Freezing Temperatures
No Infiltration

30% Cover Hydrologic Model

Infiltration Evaluation



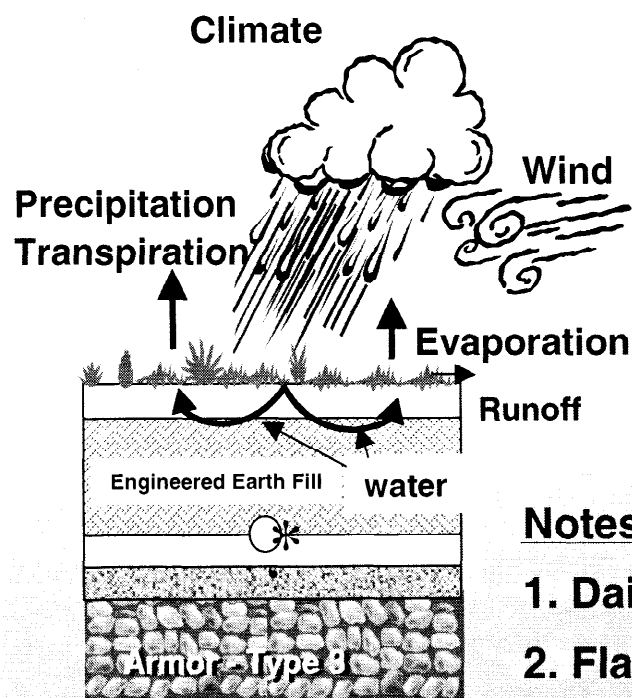
January 30 to February 20

Start of Snow Melt – Above Freezing Temperatures

$$\text{Total Precipitation} = \left(\frac{\text{Snowmelt}}{\text{Melting period}} \right) + (\text{Daily Precipitation})$$

30% Cover Hydrologic Model Results

Infiltration Evaluation Results



*Node location for evaluating flow through the cover (observation node)

Climate Condition	Results (Average Annual in Inches)			
	Precipitation	Runoff	Evapo-transpiration	Infiltration
Base Case - 1967-1976	9.33 (237 mm)	0.05 (1.3 mm)	9.25 (235 mm)	0.015 (0.38 mm)
Extreme Case 90th Percentile	13.31 mm)	0.00	13.27 (337 mm)	0.019 (338 (0.48 mm)

Notes:

1. Daily precipitation distributed over 12-hour duration
2. Flat surface so conservative
3. Poor stand of vegetation
4. Extreme climate conditions - 4 back-to-back precipitation events
5. Selected wet year for beginning of simulation
6. Good correlation with INEEL engineered barrier field pilot tests